

# **Barriers to Internationalisation: Firm-Level Evidence from South Africa**

By

**Dr. Marianne Matthee and Prof. Waldo Krugell**

School of Economics, North-West University (Potchefstroom Campus)

Paper prepared for the Abstract prepared for the Biennial Conference of the Economic Society of South Africa, 5-7 September 2011, University of Stellenbosch, Stellenbosch.

## **Abstract**

The internal resource barriers that firms experience influence their capability to export. This in turn influences the export performance of the country and the extent to which exports contribute to economic growth. The aim of this paper is to analyse the impact of resource barriers, more specifically firm size, productivity, firm-specific capital and labour market constraints, on South African firms' decision to internationalise. The literature on South African exporting firms presents some interesting glimpses of the exporting behaviour of firms in South Africa. However, these were cross-sectional studies focusing on earlier NES data and the 2003 ICA data. This paper tries to provide another dimension in terms of data, by taking the 2007 ICA data into account and by constructing a unique panel from the World Bank Enterprise Survey data for 2003 and 2007. Using panel data allows for better understanding of South African firms in that it enables one to consider the dynamic nature of firms over time. Also, the earlier South African contributions examined the export behaviour of South African firms, but did not control for unobserved heterogeneity. This paper takes the analysis a step further by estimating a panel data two-step Heckman selection model of the predictors of firms' export propensities and intensities. From the overall results of the model, it is clear that the unobserved factors that make export more likely tend to be associated with lower levels of exports. The main findings are that firm size, productivity and finance matter for exports. Also, barriers to doing business, such as electricity, customs delays and transportation and the use of imported inputs influence exporting firms' supply-side capabilities.

**JEL classification code: F23**

## 1. Introduction

Exports are considered good for economic growth. The benefits of exports for growth include knowledge spillovers, economies of scale, accumulation of foreign exchange and efficient allocation of resources (Foster, 2006). Exports, as a generator of economic growth, are therefore always included in government policy. South Africa is no exception (Edwards, Rankin & Schoër, 2008). In 2010, the South African government launched its new strategy for economic growth and development. The New Growth Path sets forth a plan to increase the economic growth rate to 7% per annum over a 20 year period thereby eliminating the persistent and large scale unemployment that the country faces. One component of the New Growth Path is to grow South Africa's market through increased exports to the Southern African region and other fast growing economies (South African Government, 2010). Alongside the New Growth Path, and the emphasis on exports, is the much-debated topic of the overvalued rand exchange rate. Recently, there have been calls from business and trade unions for the South African Reserve Bank to weaken the value of the rand, stating that the overvalued rand is the reason for South Africa's inadequate export performance (Creamer, 2010).

Export performance is however, not only influenced by macroeconomic factors such as the exchange rate. It is also influenced by the exporting firms' supply-side capabilities and the barriers they experience in both the entry into foreign markets and in expanding their exporting activities (Hollensen, 2007). It is therefore imperative that both private and public sector decision-makers understand the extent of exporting firms' capabilities and the barriers that they face (Ramaseshan & Soutar, 1996). Edwards *et al.* (2008) emphasise that in order to understand exporting firms in South Africa, one need to examine the dynamic nature of firms over time. Considering firms over time allows for insights that are not gained from cross-sectional analyses. It is herein that this paper makes a contribution. A unique panel constructed from the World Bank Enterprise Survey data for 2003 and 2007, is used in the analysis. The main findings are that firm size, productivity and finance matter for exports. Also, barriers to doing business, such as electricity, customs delays and transportation and the use of imported inputs influence exporting firms' supply-side capabilities.

The aim of the paper is to analyse the impact of firm size, productivity, firm-specific capital and labour market constraints to South African firms' decision to internationalise. Ultimately, internal resource barriers influence a firm's capability to export, which in turn influences the export performance of the country and the extent to which exports contribute to economic growth. The paper is structured as follows: section 2 provides a brief overview of the literature on export barriers, section 3 describes South African firm-level evidence, section 4 contains the empirical analysis, which includes descriptive statistics, the regression and the results and finally, section 5 concludes with recommendations.

## 2. Literature Review on Export Barriers

A country's exports (and thus its export performance) are in effect the aggregate sum of all firm-level exports. Firm level exports are the result of firm internationalisation. Internationalisation can be defined as a strategic manner in which entrepreneurial firms can achieve growth (Suárez-Ortega, 2003), especially those firms whose business scope has been restrained geographically or firms that are experiencing competition on both local and international front (Lu & Beamish, 2001). Benefits of firm internationalisation include the improvement of a firm's financial position by generating more revenues and funds that could be used for reinvestment and growth, efficiently allocating and utilising production capabilities and improving management skills (Leonidou, 2004; Arteaga-Ortiz & Fernández-Ortiz, 2010). Originally internationalisation implied that a firm either participated in foreign markets by exporting or through foreign direct investment. Nowadays, a firm can choose to undertake international activities through exporting, licensing and franchising, joint ventures or the establishment of foreign subsidiaries. Of these, exporting is the most common and the usually the norm, especially for smaller firms (Czinkota & Ronkainen, 2002; Szabó, 2004; Mtigwe, 2005).

In the process of internationalisation, however, barriers exist that obstruct successful export operations and cause firms not to be able to reap the above-mentioned benefits (Leonidou, 2004). Export barriers can be defined as *"all those factors – external or internal – that serve to dissuade a firm from exporting or which hinder its actual export activity"* (Suárez-Ortega, 2003:403). In other words, export barriers (also called problems or obstacles) occur at various stages in the internationalisation process - it could either deter export initiation or hamper the process of internationalisation (Hollensen, 2007). Also, firms experience the barriers differently, depending on their size, whether or not they are interested in internationalising and stage in which they are in during the internationalisation process (Morgan, 1997; Jaeger, 2008). Since Bilkey and Tesar (1977) and Bilkey (1978) pioneered the first studies, export barriers have been investigated extensively in various contexts and countries (Arteaga-Ortiz & Fernández-Ortiz, 2010). The aim of such research is to identify the barriers to firm internationalisation and to subsequently provide recommendations on how to reduce or eliminate them. Research has also been focused on smaller firms, as these firms experience more barriers than their larger counterparts that have more resources to their disposal (Jaeger, 2008).

In the literature, a wide range of barriers have been identified (Arteaga-Ortiz & Fernández-Ortiz, 2010). In order to explain them logically, different classifications have been used to group export barriers. A brief overview of all the various classifications follows in the paragraphs below. Leonidou (2004: 283) classifies export barriers as either internal or external. Internal barriers relate to the firm's capabilities, resources and capacity to operate internationally. They are grouped as informational, functional and marketing barriers. External barriers that are those factors over which the firm has no control and are a result of the environment in which the firm operates and are grouped into procedural, governmental, task and environmental barriers. Fillis (2002), for example, investigated UK micro-enterprises'

internal and external barriers to internationalisation. A further refinement of this classification is to organise internal and external barriers into four groups according to domestic or foreign location (Leonidou, 1995, Morgan, 1997; Crick, Al Obaidi & Chaudhry, 1998). The first group is internal-domestic problems which are problems that arise within the firm and are experienced in the home country. Examples include lack of qualified personnel (Yang, Leone & Alden, 1992), insufficient production capabilities (Yaprak, 1985) and management focusing on the domestic market (Rabino, 1980). The second group is internal-foreign problems, i.e. problems within the firm but experienced in the foreign country. Barriers included here are high transportation costs and logistical difficulties, international payment problems (Morgan & Katsikeas, 1997) and limited knowledge of foreign markets (Barrett & Wilkinson, 1985). The third source of export barriers is problems that arise from the external environment but experienced within the home country (i.e. external-domestic problems). Here the complexity of the documentation required (Rabino, 1980) and the high cost to finance export activities (Korth, 1991) cause export barriers. The fourth group consists of external-foreign problems, which are uncontrollable problems found in international markets. Examples include foreign government restrictions and rules (Hook & Czinkota, 1998), language and cultural differences (Westhead, Wright & Ucbasaran, 2002) and the intensity of foreign competition (Ramaswami & Young, 1990).

A third type of classification was presented by Morgan and Katsikeas (1997) where export obstacles are also clustered into four groups, namely strategic obstacles, operational and logistical obstacles, informational obstacles and process-based obstacles. Limited resources create strategic obstacles, whereas inaccuracies regarding pricing, promotion, distribution and product create operational (and logistical obstacles). Westhead *et al.* (2002) and Jaeger (2008) further explain that lack of reliable information or knowledge about the foreign market create informational obstacles and finally the inability to maintain interactions with key stakeholders in export activities and distribution channels create process-based obstacles.

A fourth classification of export barriers is where the barriers are bundled into the knowledge, procedural, exogenous and resource categories (Ramaswami & Young, 1990). Knowledge barriers are broadly defined as the lack of information on the exporting activity, or ignorance on the matter. Internal resource barriers are due to lack of finances, productive capacity or external aid. Procedure barriers are elements in the process of exporting that makes the activity difficult e.g. logistics and the documentation required. Finally, exogenous barriers include any obstacles that arise as a result of uncertainty in the international market place or other role players such as governments and competitors (Suárez-Ortega, 2003; Arteaga-Ortiz & Fernández-Ortiz, 2010<sup>1</sup>; Okpara & Koumbiadis, 2011).

The focus of this paper, depending on the type of classification, is on internal (functional) barriers, internal-domestic barriers, strategic obstacles or internal resource barriers. Okpara and Koumbiadis (2011) summarise that resource barriers such as the high cost of labour, lack of production capacity and lack of personnel with suitable export experience and knowledge hamper a firm's capability to internationalise. This draws on the theoretical framework of the

---

<sup>1</sup> Arteaga-Ortiz and Fernández-Ortiz (2010: 404-406) also provides a comprehensive list on all the empirical work conducted on each category.

resource-based view of the firm and explains why firms (especially smaller firms) decide to export or not (Westhead *et al.*, 2002; Dhanaraj & Beamish, 2003). A firm's resources can overcome, or cause difficulties in internationalisation. Firms with resources are more likely to engage in exporting than those who do not possess resources (Wilkinson & Brouthers, 2006). A resource can be defined as any factor that can be considered a strength or a weakness in a firm. A firm's resources may also be strategic, i.e. provide the firm with a competitive advantage and therefore be valuable, rare, imperfectly mobile and non-substitutable (Dhanaraj & Beamish, 2003). Dhanaraj and Beamish (2003) list three sets of resources: managerial or organisation resources, entrepreneurial resources and technological resources. The first set of resources (managerial or organisation) is usually proxied by firm size. Smaller firms tend to have fewer resources than larger firms and therefore struggle to weather adverse market conditions. Managers of small firms are also more orientated towards the survival of the firm, rather than fast business growth through international exposure. Entrepreneurial resources are the drive of managers to see their business grow. Entrepreneurs (or firms) that do not have the right business skills and are usually unaware of export opportunities and this impedes their firms' internationalisation. The third set of resources includes tangible and intangible assets within a firm. Research and development expenditure is used here to indicate a firm's technological intensity necessary to gain a competitive advantage that promotes the firm's internationalisation (Westhead *et al.*, 2002; Dhanaraj & Beamish, 2003). Jaeger (2008) further highlights that finance may obstruct optimal export or internationalisation performance. Finance is required to be able to hire adequate personnel and obtain the necessary and latest technology (Westhead *et al.*, 2002). Jaeger (2008) explains that financing and access to finance is one of the most important issues for internationalising firms. This is emphasised by Bellone *et al.* (2010) who recently studied the relationship between financial constraints and firm export behaviour (among French firms) and find that firms that have better access to finance are more likely to internationalise and are also able to internationalise faster. In summary, a firm's resources determine both the export strategy implemented by the firm and its subsequent export performance (Westhead *et al.*, 2002; Jaeger, 2008).

### **3. The Case of South Africa**

South African research has not focused on export barriers but has examined the determinants or predictors of firms' export propensities and intensities. It is important to note that the results obtained in the literature are sensitive to the sampling strategy employed in the different surveys.

Early work by Rankin (2001) examined firm-level data collected by the Greater Johannesburg Metropolitan Council (GJMC) and the World Bank in 1999. In this sample of 325 firms 71 % of firms exported and the export intensity was on average 18 % of output. However, less than half of the firms exported more than 10 % of their output. Larger firms were more likely to export. The exporters typically produced more output per employee and they had higher average labour costs. The more efficient firms were more likely to export outside of the

SADC. Rankin (2001) argued that there may be some efficiency threshold that firms have to exceed before they can export globally.

In similar fashion, Naudé *et al.* (2000) examined the determinants of exports of manufacturing firms in the North West Province. In 1999 interviews were conducted at 68 firms and they found that 48 % of manufacturing firms exported. They also found that the large firms exported output in the two preceding years, but do not specialise in exporting. Analysis of the determinants of exports showed that they larger, more efficient firms were more likely to export and also tended to export a larger percentage of their production.

Gumede and Rasmussen (2002) assessed key export success factors using data from the 1999/2000 National Enterprise Survey (NES). In this case 1300 firms responded, but the analysis used data for only the 491 small and medium-sized manufacturers. They found that 25% of very small firms (6-20 employees) exported, 41% of small firms (21-50 employees) exported and 59% of medium-sized firms (51-200 employees) were exporters. As in the other surveys it seems that a large share of firms were exporting, but their export earnings made up only a small part of total turnover. Export earnings were at 7% or less for at least half of all the exporters. The analysis distinguished between the characteristics of exporters and non-exporters. Gumede and Rasmussen (2002) found that there was a greater share of exporters amongst firms that were subsidiaries of local or foreign companies. Belonging to a business association did not increase the probability to export. Firms that exported were more likely to have a website and to use South African suppliers as a source of information. Throughout, smaller firms were more likely to face financial and other constraints. Amongst the medium-sized and large firms the exporters were relatively less constrained.

In later work Gumede (2004) re-examined the NES data using information of 941 firms of which 415 were exporters. Correlation and regression analysis were undertaken to examine export propensities and intensities. The results from a logistic regression showed that the probability of exporting is positively associated with firms' size, age, linkages, access to information and whether a firm was constrained by competition in South Africa. Export intensity was positively associated with the number of employees, access to information and linkages. It was negatively associated with sunk costs, financial constraints and an unstable exchange rate.

Further work by Rankin and collaborators also examined firm-level data collected by the World Bank Investment Climate Assessment (ICA) Surveys in 2003. This was a survey of predominantly manufacturing firms (603 firms) in the metropolitan areas of the Gauteng Province, Western Cape, Eastern Cape and KwaZulu-Natal. Rankin and Schoër (2008) examined exporting, labour demand and wages using firm-level data matched with workers from the 2003 survey. They found that exporters were more likely to employ older workers, males and workers with more education. However, when they controlled for firm size, job type, sector and province the differences are not significant. They also considered direct exporters and significant exporters that export a greater share of output, but this did not affect the type of people employed. Only the export destination came up as important where workers employed by SADC exporters were more likely to be male and younger than those employed by non-SADC exporters. Rankin and Schoër (2008) also estimated Mincerian wage equations to determine

whether there is a difference in earnings between workers at firms with different types of export behaviour. They found that working for an exporter does not imply different levels of earnings, but it did seem that significant exporters paid higher wages, but SADC exporters paid lower wages than other firms.

Edwards *et al.* (2008) summarised the South African literature on South African exporting firms. The stylised facts were that South African exporters were larger and more productive than non-exporters. But relatively few firms exported and they exported only a small proportion of output. Also, the productivity of exporters has been closely linked to the export destination with the results showing that firms that export beyond the SADC were more productive.

Other contributions to the South African literature have focussed less on exporters, but have examined aspects that may be relevant as export barriers. Rankin (2006) examined the regulatory environment and the impact that it has on SMMEs using data from the 2003 ICA survey. Krugell and Matthee (2010) employed the 2007 ICA data to examine access to finance, sources of finance and productivity. The results showed that firms that were finance constrained were more vulnerable to shocks and competition as well and were weaker contributors to employment creation and growth. They were typically small and less established. They held less stock and had lower capacity utilisation. They were unlikely to be exporters or to introduce new products in response to competition. The results from the regression model confirmed that access to finance and different sources of finance were drivers of productivity at firm level. Loots and Krugell (2011) constructed indicators of infrastructure service delivery using the 2007 ICA dataset. The results showed that the firms that were surveyed did not perceive infrastructure to be a major obstacle to doing business and the majority experienced average and above average infrastructure service delivery. The services received by large firms raised the greatest concern and there did not seem to be systematic delivery differences between the four major South African cities. There was a positive correlation between the aggregate infrastructure service delivery measure and output per worker.

In summary it can be said that the literature presents some interesting glimpses of the exporting behaviour of firms in South Africa. Edwards *et al.* (2008) emphasise that there are significant data shortcomings and that in order to understand exporting firms in South Africa, one needs to examine the dynamic nature of firms over time. It is herein that this paper makes a contribution. The following section presents the results of the analysis of a panel constructed from the World Bank Enterprise Survey data for 2003 and 2007. The aim is to analyse the impact of firm size, productivity, firm-specific capital and labour market constraints to South African firms' decision to internationalise.

#### **4. Empirical Analysis**

In South Africa, firm-level data present particular challenges to researchers. Rankin (2006) explains that a number of firm-level surveys have been carried out in South Africa, but they

have been *ad hoc* and the surveys have not always been designed for quantitative analysis. Given these constraints, this paper employs data from the 2003 and 2007 Investment Climate Assessment World Bank Enterprise Surveys. The World Bank surveys were national in scope and covered different sectors. Table 1 shows that in total the 2003 survey covered 603 firms in four locations. More than half of the firms were located in the greater Gauteng agglomeration that includes Johannesburg, the East Rand and Pretoria. The 2003 survey was predominantly of medium-sized and large manufacturing firms and contained a large share of exporting firms. The 2007 survey covered 1055 firms of which 707 were manufacturers. Again, the majority of firms are from Johannesburg, the East Rand and Pretoria. Viewed per place and per sector, manufacturers of food products, garments, chemicals and fabricated metal products make up the majority of the respondents. Table 1 shows that the 2007 survey data include more small firms than in the earlier 2003 survey. In the 2007 data there were similar proportions of small, medium and large firms. In comparison with the 2003 survey, the 2007 survey contained fewer exporters.

*Table 1: Enterprise survey description, numbers of firms*

	Johannesburg/ East Rand/ Pretoria		Cape Town		Port Elizabeth		Durban	
	2003	2007	2003	2007	2003	2007	2003	2007
<b>Number of firms</b>	372	455	132	115	36	53	63	84
<b>Sub-sector:</b>								
Food	37	86	21	16	2	11	3	9
Textiles	2	4	11	3	7	0	6	4
Garments	7	68	10	18		10	6	12
Chemicals	42	51	5	16	3	9	5	7
Plastics and rubber	19	14	6	3	3	2	6	3
Non-metallic mineral products	17	2	4	5		0	4	1
Basic metals	18	2		0		0		0
Fabricated metal products	39	71	6	13	2	5	3	21
Machinery and equipment	31	25	4	6		0		3
Electronics	37	15	3	1	1	3		3
Other manufacturing	64	117	31	34	11	13	13	21
<b>Size class:</b>								
Small (5-19)	30	156	22	42	3	19	3	18
Medium (20-99)	165	161	60	45	11	17	21	46
Large (>100)	177	111	47	28	20	17	32	20
<b>Number of exporters</b>	263	100	58	40	21	9	30	12

*Source: Authors' own calculations using World Bank data*

The following sub-section describes the firms contained in the two datasets, focussing on the exporters. The two datasets are discussed separately, because the two surveys asked slightly different questions of interest to this paper.

## 4.1 Descriptive Statistics

### 4.2.1 The 2003 dataset

There are 603 firms in the 2003 dataset, of which 239 were non-exporters and 364 exporters. Table 2 compares the exporting firms with the non-exporting firms in 2003 (the numbers or percentages reported here are averages).

*Table 2: Exporters and non-exporters in the 2003 dataset*

	N	Exporters	N	Non-exporters
<b>Financial barriers</b>				
Internal funds or retained earnings as a % of working capital	360	66.50	237	65.14
Financing borrowed from banks as a % of working capital	360	16.96	237	15.72
Financing borrowed from non-bank institutions as a % of working capital	360	4.05	237	4.21
Purchases on credit from suppliers and advances from customers as a % of working capital	360	11.23	237	12.27
Net value of machinery (in Rands)	307	42m	191	20m
Net value of land and buildings (in Rands)	298	14m	185	3m
<b>Labour market barriers</b>				
Number of employees	360	443.11	234	154.27
Number of temporary / seasonal workers	178	75.22	78	30.87
Total cost of labour (in Rands)	302	91m	185	10m
% of workforce unionised	362	58.07	235	49.39
<b>Firm-specific</b>				
Total sales in 2002 (in Rands)	348	448m	227	104m
Age (in years)	364	34.44	239	20.09
% of foreign ownership in firm	364	20.11	239	8.07
Management experience in sector (in years)	363	13.75	238	12.84
% local market share	340	32.06	219	26.09
% national market share	349	28.89	214	17.79
% national sales of total sales	361	76.84	239	100
% exports of total sales	364	23.79	-	-
Export experience (in years)	201	16.79		
Number of new products introduced over the last three years	355	19.84	229	23.76
Amount spent on research and development during 2002 (in Rands)	326	1m	203	899 844

*Source: Authors' own calculations using World Bank data*

Exports were calculated and exporters identified by taking total sales and subtracting the domestic, national sales. The largest numbers of both the exporters and non-exporters were located mainly in Gauteng, followed by the Western Cape, KwaZulu-Natal and the Eastern Cape. Most of the non-exporters (56.3%) were medium-sized firms, whereas the majority of exporting firms were large (59.2%). The majority of managers of firms that export have a post-graduate degree (42.6%) and the highest education level of non-exporting managers was a graduate degree (31.9%). Exporters perceived labour regulations to be a moderate problem to the operation and growth of their businesses. Non-exporters perceived labour regulations not to be a problem. More exporters perceived the skills and education of available workers to be an obstacle to their business, while the opposite was true for access to finance. In terms of innovative resources, more exporters (28.3%) obtained production technology from a foreign-owned company than non-exporters (13.8%). Furthermore, more exporters (36.5%) felt that their technology was more advanced than their competitors (only 26.5% of non-exporters felt that this was the case). Moreover, 52.6% of exporters received ISO management certification as opposed to the 26.9 % of non-exporters. Exporters, over the last three years, also undertook more innovative initiatives than exporters, for example the development of a major new product line, upgrading an existing product line and the introduction of new technology that substantially changed the manner in which the main product was produced.

The most significant differences between the exporters and non-exporters in this dataset appear to be in foreign ownership, age, number of employees, number of temporary employees, total sales, total cost of labour, the net value of machinery and land and the percentage of the workforce that is unionised. Exporters have a higher average in all these cases, however the exporters did not specialise in exports as their percentage exports of total sales is less than 25 %.

#### **4.2.2 The 2007 dataset**

There are 1055 firms in the 2007 dataset, of which 824 were non-exporters and 231 exporters. The majority of non-exporting firms (around 69.8%) were located in Johannesburg, followed by Durban (13%), Cape Town (10.6) and Port Elizabeth (6.7%). Exporters were also mostly located in Johannesburg (61.5%), but with more firms located in Cape Town (25.1%) and less in Durban (8.7%) and Port Elizabeth (4.8%). Around 48 % of non-exporters were small firms (i.e. 5 – 19 employees), 39 % were medium-sized (20 – 99 employees) and 13 % large (100 employees and more). There were more large firms (44%) and medium-sized firms (40%) that exported, not many small firms (15%) exported. The majority of managers of non-exporting firms (27%) had an education level consisting of vocational training, while managers of exporting firms (36%) had a graduate degree. Most exporters also used technology imported from a foreign country (28%) and were ISO certified (61%). For non-exporters, this was not the case (9% uses foreign technology and only 22% ISO quality certification). In terms of obstacles to operations, exporting firms perceived labour regulations, as well as an uneducated workforce to be larger obstacles than did non-exporting firms, whereas the inverse was true for access to finance.

Table 3 compares some of the characteristics of the exporting firms with the non-exporting firms in 2007 (the numbers or percentages reported here are averages).

Table 3: Exporters and non-exporters in the 2007 dataset

	N	Exporters	N	Non-exporters
<b>Financial barriers</b>				
Internal funds or retained earnings as a % of working capital	231	63	824	71.55
Financing borrowed from banks as a % of working capital	231	8.17	824	6.31
Financing borrowed from non-bank institutions as a % of working capital	231	0.91	824	0.94
Purchases on credit from suppliers and advances from customers as a % of working capital	231	27.11	824	19.72
Total cost of raw materials (in Rands)	210	80m	824	6m
Cost of machinery (if the firm had to replace current machinery in similar condition) (in Rands)	209	65m	589	13m
Cost of land and buildings (if the firm had to replace current machinery in similar condition) (in Rands)	210	26m	588	13m
<b>Labour market barriers</b>				
Number of employees	231	215.70	824	64.49
Number of skilled employees	204	87.48	476	37.03
Number of unskilled employees	204	67.16	476	19.97
Number of temporary / seasonal workers	225	48.14	709	10.06
Total cost of labour (in Rands)	231	36m	589	12m
<b>Firm-specific</b>				
Total sales in 2006 (in Rands)	231	194m	824	35m
Age (in years)	231	29.62	824	13.35
% foreign ownership of the firm	231	19.06	823	8.13
Management experience in sector (in years)	231	19.01	822	12.30
% local market share	224	11.49	710	9.77
% national market share	224	6.25	711	2.30
% national sales of total sales	231	78.12	824	100
% exports of total sales	231	21.88	-	-
Export experience (in years)	227	14.86		

Source: Authors' own calculations using World Bank data

The most significant differences between the exporters and non-exporters in this dataset appear to be in foreign ownership, age, management experience, number of employees (as well as skilled and unskilled employees), number of temporary employees, total sales, total cost of labour and raw materials, the net value of machinery and land and the percentage of the workforce that is unionised. Exporters have a higher average in all these cases, similar to those in the 2003 dataset. The exporters still did not specialise in exports as their percentage exports of total sales is less than 22%.

In summary, it is clear that there exist some differences between the exporters and non-exporters in the World Bank Enterprise survey datasets. These correspond with what Gumede and Rasmussen (2002) and Gumede (2004) found in the earlier NES data and what Edwards *et al.* (2008) summarised from the 2003 ICA data. These earlier contributions also examined the

export behaviour of South African firms but did not control for unobserved heterogeneity. The following sub-section takes the analysis a step further by estimating a panel data model of the predictors of firms' export propensities and intensities.

## 4.2 Regression Analysis

To examine the importance of firm-size, productivity and firm-specific constraints on the decision to engage in international markets, one should distinguish between the predictors of export propensity and export intensity. The sample of firms contains firms that export and others that do not and if there are variables that affect export participation an OLS model of the determinants of exports will produce biased and inconsistent results. To address this issue of selectivity a two-step Heckman selection model is estimated. The first step estimates the probability of a firm being an exporter as a function of a control variable. This control variable is assumed to affect the probability of export participation but does not influence the level of exports. The second step estimates the predictors of the level of exports. This approach follows Arndt *et al.* (2009) as a way to examine export propensity (extensive margin) and intensity (intensive margin) simultaneously. In the selection equation the selection variable is whether the firm has foreign ownership or not. Gumede and Rasmussen (2002) found that there was a greater share of exporters amongst firms that were subsidiaries of foreign companies. Export propensity is modelled as a function of productivity, firm size, three groups of explanatory variables (financial barriers, labour market barriers and barriers to doing business) and firm-specific control variables. Table 4 summarises the variables.

The earlier research with South African datasets showed a positive relationship between productivity and exports and firm-size and exports. Here *productivity* is measured by the natural log of the value of sales per worker and the firm-size by the natural log of the number of workers, named *employees*. The financial barriers include a self-reported measure of the degree to which access to finance is a constraint to doing business. The variable *accessfinance* =1 for firms that reported that access to finance is a major or very severe obstacle. A negative coefficient is expected. The survey also asked about the percentage of finance from different sources used to finance new fixed assets and these are included here. It is expected that firms which use more internal funds and supplier credit to finance fixed assets face greater barriers than those which are able to issue new shares. There are four measures of labour market barriers. The expectation is that firms that export more would use fewer unskilled workers but possibly more temporary workers. The model also includes two self-reported measures of whether labour market regulations and work force education are constraints to doing business. The third group of explanatory variables are other barriers to doing business and, by extension, exporting. These include the average number of days that exports spend in customs, self-reported measures of constraints in telecommunications, electricity supply, transport, corruption and crime. Whether the firm owns or shares an electricity generator is also included here. The final block is the firm-specific control variables. These include the age of the firm, whether the firm imports inputs and whether it uses foreign-licensed technology in its production process. In all cases positive coefficients are expected.

Table 4: Variables (see table 5 for the regression results)

<b>Variable</b>	<b>Description</b>
productivity	natural log of the value of sales per worker
employees	natural log of the number of workers to measure firm-size
foreign_own	The percentage of firms owned by foreign individuals, companies or organisations
<b>Financial barriers</b>	
obs_fin	The firm's observation of the extent to which access to finance presents an obstacle to its operations
fa_internal	The proportion of financing obtained from internal funds or retained earnings
fa_suppliers	The proportion of financing obtained from purchases on credit from suppliers and advances from customers
fa_newshares	The proportion of financing obtained from the issue of new shares
<b>Labour market barriers</b>	
unskilled	The number of unskilled production workers
tempworkers	The number of seasonal or temporary workers
obs_labourreg	The firm's observation of the extent to which labour regulations present an obstacle to its operations
obs_workforce	The firm's observation of the extent to which an uneducated workforce presents an obstacle to its operations
<b>Barriers to doing business</b>	
obs_telecom	The firm's observation of the extent to which telecommunications present an obstacle to its operations
obs_elect	The firm's observation of the extent to which electricity presents an obstacle to its operations
obs_transport	The firm's observation of the extent to which transportation of goods, supplies and inputs presents an obstacle to its operations
obs_corruption	The firm's observation of the extent to which corruption presents an obstacle to its operations
obs_crime	The firm's observation of the extent to which crime presents an obstacle to its operations
generator	Dummy variable on whether or not the firm owns or shares a generator
<b>Firm-specific control variables</b>	
firm_age	The age of the firm
Imp_inputs	Dummy variable on whether or not the firm imported any material inputs and/or supplies
foreignlicence	Dummy variable on whether or not the firm use technology licensed from a foreign owned company

The following sub-section presents the results of the estimation, but there are a number of limitations to keep in mind. First, the panel is small with only 191 firms for the two time periods. The World Bank used two different contractors, Citizen Surveys in 2003 and EEC Canada in 2007, to conduct the two cross-section surveys that also yielded panel data. In the

2007 survey EEC Canada received a list of 716 firms from those surveyed in 2003. Of those 137 had to be excluded which left a potential total of 579 panel establishments. In the end 231 firms were surveyed of which 40 appeared to have closed (World Bank, 2007). Unfortunately, the published data set does not include information on those firms and it is impossible to determine what the characteristics of the firms that closed down were. Second, it is not possible to match the firms' responses to all the questions in both surveys. This limits the variables that can be included in the analysis (compared to those that are included in the descriptive above). Even with careful matching, the panel is still unbalanced with some missing observations.

### **4.3 Results**

Table 5 shows the results of the Heckman selection model. The results of the first-step Probit regression shows that foreign ownership is positively and significantly related to export propensity. Note that the Mills ratio is negative and significant at the 5% level. This suggests that the error terms in the selection model and the primary equation are negatively correlated. This means that unobserved factors that make export more likely tend to be associated with lower levels of exports.

Consistent with previous empirical evidence there is a strong positive relationship between firms' exports and productivity and size. The positive coefficient for the firm age variable supports this – older, and presumably larger and more productive firms, export more – but the coefficient is not significant. The coefficients of productivity and exports are significant at the 5% level. The negative coefficient of the firm age squared variable indicates that there may be some turning point at which a very older firm would export less. The variables that measure financial barriers have the expected signs. Firms that reported that access to finance is an obstacle to doing business, export less. There is also a negative relationship between exports and the financing of fixed assets through internal retained earnings or supplier credit. Firms that finance more of their fixed assets through issuing new shares export more. Regarding labour market constraints the results show positive relationships between using unskilled workers and exports and between using temporary workers and exports. The two self-reported measures of whether labour market regulations and workforce education are constraints to doing business, show positive relationships with exports. With these variables the causation may not be simple: employing more temporary workers, or perceiving labour regulations and workforce education as constraints may not increase exports, rather, firms that export more may have to employ more temporary works and tend to experience regulations and education as constraints.

Table 5: Regression results

Variable	Volume
<b>Size and productivity</b>	
productivity	<b>1.66e-09 (6.08)***</b>
employees	<b>1.120771 (4.39)***</b>
<b>Financial barriers</b>	
obs_fin	-0.9338852 (-0.70)
fa_internal	-0.0017864 (-0.26)
fa_suppliers	<b>-0.0537548 (-2.11)**</b>
fa_newshares	0.2986012 (1.38)
<b>Labour market barriers</b>	
unskilled	0.0283568 (0.07)
tempworkers	0.5717045 (0.53)
obs_labourreg	0.165538 (0.06)
obs_workforce	0.1597978(0.62)
<b>Barriers to doing business</b>	
dayscustom	<b>0.2207892 (2.74)***</b>
dayscustomsq	-0.003393 (-1.49)
obs_telecom	-0.3048902 (-0.85)
obs_elect	-0.2263225 (-1.22)
obs_transport	<b>0.5303214 (1.70)*</b>
obs_corruption	0.1368557 (0.49)
obs_crime	-0.004979 (-0.02)
generator	<b>1.386769 (2.56)**</b>
<b>Firm-specific control variables</b>	
firm_age	0.0044942 (0.13)
firamgesq	-0.0000807 (-0.22)
imp_inputs	<b>0.2054767 (1.74)*</b>
foreignlicence	0.9206376 (1.39)
constant	11.10958 (3.92)***
<b>Selection</b>	
foreign_own	<b>0.0065984 (3.24)***</b>
constant	-0.2707214 (-3.30)***
<b>Diagnostics</b>	
No. of observations	298
Censored observations	167
Uncensored observations	131
Wald $\chi^2$	71.87 (0.00)***
Mills lambda	-4.55808 (-2.02)**

Note: z-ratios in parenthesis. \*\*\*, \*\* and \* indicate significance at the 1%, 5% and 10 % levels respectively.

Source: Authors' calculations.

A third group of explanatory variables represent other barriers to doing business. The results show a positive and significant relationship between exports and the average number of days that exports spend in customs. Again, customs delays do not promote exports, but firms that

export more, may also experience more days of customs delays. The negative coefficient on the squared term of customs days indicates that very long customs delays will be negatively related to exports. The results also show negative relationships between exports and perceived constraints related to telecommunication, electricity supply and crime. There are positive coefficients for perceived constraints of transport and corruption, but again, it may be that firms that export more are also more likely to experience problems with transport and corruption. The results show a large positive and significant coefficient for the relationship between exports and firms' ownership of generator. The final set of coefficients is for the firm-specific controls. The firm age variables have been discussed but the results also show a positive (and significant at 10% level) relationship between using imported inputs and exports. There is a positive, but insignificant relationship between using foreign licensed technology and exports.

## **5. Conclusions and Recommendations**

The internal resource barriers that firms experience influence their capability to export. This in turn influences the export performance of the country and the extent to which exports contribute to economic growth. The aim of this paper is to analyse the impact of resource barriers, more specifically firm size, productivity, firm-specific capital and labour market constraints, on South African firms' decision to internationalise.

The literature on South African exporting firms presents some interesting glimpses of the exporting behaviour of firms in South Africa in for example Gumede and Rasmussen (2002), Gumede (2004) Edwards *et al.* (2008). However, these were cross-sectional studies focusing on earlier NES data and the 2003 ICA data. This paper tries to provide another dimension in terms of data, by taking the 2007 ICA data into account and by constructing a unique panel from the World Bank Enterprise Survey data for 2003 and 2007. Using panel data allows for better understanding of South African firms in that it enables one to consider the dynamic nature of firms over time. Also, the earlier South African contributions examined the export behaviour of South African firms, but did not control for unobserved heterogeneity. This paper takes the analysis a step further by estimating a panel data two-step Heckman selection model of the predictors of firms' export propensities and intensities.

From the overall results of the model, it is clear that the unobserved factors that make export more likely tend to be associated with lower levels of exports. Consistent with previous empirical evidence, there is a strong positive relationship between firms' exports and productivity and size. Therefore, South African firms need to operate in an environment which fosters their growth. More specifically, South African exporting firms tend to be finance constrained, as their most important sources of finance are from their suppliers. This indicates that there is a cap on their growth and the extent to which they can internationalise, as they find it difficult to obtain finance from traditional banking sources. Secondly, having access to a generator correlates positively to exports, which further emphasises the need for investment in electricity in South Africa. Thirdly, customs delays and transportation present barriers to

exporters. The majority of firms in the panel are situated in Gauteng, which highlights the skewed distribution of international economic activity in South Africa. These exporters are located around 600km from the nearest harbour. The inland distance implies higher domestic transport costs and this, together with customs delays, erodes their competitiveness. Finally, the results show that there is a positive relationship between South African exports and imported inputs. This adds another perspective on the South African rand exchange rate, as a weaker rand would in fact also erode exporters' competitiveness.

## References

- ARTEAGA-ORTIZ, J. & FERNÁNDEZ-ORTIZ, R. 2010. Why don't we use the same export barrier measurement scale? An empirical analysis in small and medium-sized enterprises. *Journal of Small Business Management*, 48(3): 395-420.
- BARRETT, N. & WILKINSON, I.F. 1985. Export stimulation: a segmentation study of the exporting problems of Australian manufacturing firms. *European Journal of Marketing*, 19(2): 53-72.
- BELLONE, F., MUSSO, P., NESTA, L. & SCHIAVO, S. 2010. Financial constraints and firm export behaviour. *The World Economy*, 33(3): 347-373.
- BILKEY, W.J. 1978. An attempted integration of the literature on the export behaviour of firms. *Journal of International Business Studies*, 9(1): 33-46.
- BILKEY, W.J. & TESAR, G. 1977. An attempted integration of the literature on the export behaviour of firms. *Journal of International business Studies*, 9(1): 33-46.
- CREAMER, T. 2010. OECD says activist currency policy to avoid overvaluation could benefit SA. <http://www.engineeringnews.co.za/article/oecd-says-activist-currency-policy-to-avoid-overvaluation-could-benefit-sa-2010-07-19> (Date of access: 30 May 2011).
- CRICK, D., AL OBAIDI, M. & CHAUNDHRY, S. 1998. Perceived obstacles of Saudi-Arabian exporters of non-oil products. *Journal of Marketing Practice: Applied Marketing Science*, 47(7): 187-199.
- CZINKOTA, M.R. & RONKAINEN, I.A. 2002. *International Marketing*. Thomson South-Western: Ohio, 815p.
- DHANARAJ, C. & BEAMISH, P.W. 2003. A resource-based approach to the study of export performance. *Journal of Small Business Management*, 41(3): 242-261.
- EDWARDS, L., RANKIN, N. & SCHOER, V. 2008. South African exporting firms: what do we know and what should we know? *Journal of Development Perspectives*, 1(4): 67-92.
- FILLIS, I. 2002. Barriers to internationalisation: an investigation of the small craft microenterprise. *European Journal of Marketing*, 36(7/8): 912-927.
- GUMEDE, V. & RASMUSSEN, K. 2002. Small manufacturing enterprises and exporting in South Africa: a preliminary assessment of key export success factors. *Journal of Small Business and Enterprise Development*, 9(2):162-171.
- GUMEDE, V. 2004. Export Propensities and Intensities of Small and Medium Manufacturing Enterprises in South Africa. *Small Business Economics*, 22(5): 379-389.
- HOLLENSEN, S. 2007. *Global Marketing: A Decision-Oriented Approach*. Fourth ed., Prentice Hall, Milan.
- HOOK, R.H. & CZINKOTA, M.R. 1998. Export activities and prospects of Hawaiian firms. *International Marketing Review*, 5(4): 51-57.

- JAEGER, S. 2008. Internationalization in the face of export barriers: a study of New Zealand's firms. PhD thesis, Massey University, New Zealand.  
<http://mro.massey.ac.nz/handle/10179/1390> (Date of access: 31 May 2011).
- KRUGELL, W.F. & MATTHEE, M. 2010. Finance at firm-level: South African evidence of the links between access to finance, sources of finance and productivity. Unpublished manuscript.
- KORTH, C.M. 1991. Managerial barriers to US exports. *Business Horizons*, 34(2): 18-26.
- LEONIDOU, L.C. 1995. Empirical research on export barriers: review, assessment and synthesis. *Journal of International Marketing*, 3(1): 29-43.
- LEONIDOU, L.C. 2004. An analysis of the barriers hindering small business export development. *Journal of Small Business Management*, 42(3): 279-302.
- LOOTS, J. & KRUGELL, W.F. 2011. Public goods and private firms: delivery of infrastructure services and firms' productivity in South Africa. Unpublished manuscript.
- LU, J.W. & BEAMISH, P.W. 2001. The internationalisation and performance of SMEs. *Strategic Management Journal*, 22(6-7): 565-586.
- MORGAN, R.E. & KATSIKEAS, C.S. 1997. Obstacles to export initiation and expansion. *Omega, International Journal of Management Sciences*, 25(6): 677-690.
- MTIGWE, B. 2005. The entrepreneurial firm internationalisation process in the South African Context. *International Journal of Entrepreneurial Behaviour and Research*, 11(5): 358-377.
- NAUDÉ, W.A., OOSTENDORP, R. & SERUMAGA-ZAKE, P. 2005. Determinants of manufacturing exports: results from a regional firm-level survey in South Africa. *Studies in Economics and Econometrics*, 29(2): 107-116.
- OKPARA, J.O. & KOUMBIADIS, N.J. 2011. Strategic export-orientation and internationalisation barriers: evidence from SMEs in a developing country. *Journal of International Business and Cultural Studies*. <http://www.aabri.com/manuscripts/10469.pdf> (Accessed on 17 February 2011).
- RABINO, S. 1980. An examination of barriers to exporting encountered by small manufacturing companies. *Management International Review*, 20(1): 67-73.
- RAMASESHAN, B. & SOUTAR, N. 1996. Combined effects of incentives and barriers on firms' export decisions. *International Business Review*, 5(1): 53-65.
- RAMASWAMI, S.N. & YANG, Y. 1990. Perceived Barriers to Exporting and Export Assistance Requirements, in: S.T. Cavusgil & M.R. Czinkota (Eds.), *International Perspectives on Trade Promotion and Assistance*, CT: Quorum Books, Westport, 187-206.
- RANKIN, N.A. 2001. The export behaviour of South African manufacturing firms.  
[http://mpra.ub.uni-muenchen.de/16904/1/MPRA\\_paper\\_16904.pdf](http://mpra.ub.uni-muenchen.de/16904/1/MPRA_paper_16904.pdf) (Date of access: 31 May 2011).

- RANKIN, N.A. 2006. The regulatory environment and SMMEs. Evidence form South African firm level data.  
[http://www.commerce.uct.ac.za/Research\\_Units/DPRU/Employment\\_Promotion\\_Program/PDFS/The\\_regulatory\\_environment\\_and\\_SMMEs-Rankin.pdf](http://www.commerce.uct.ac.za/Research_Units/DPRU/Employment_Promotion_Program/PDFS/The_regulatory_environment_and_SMMEs-Rankin.pdf) (Date of access: 31 May 2011).
- RANKIN, N.A. & SCHOËR, V. 2008. Exporting, labour demand and wages in South Africa.  
[http://www.commerce.uct.ac.za/Research\\_Units/DPRU/Conference2008/Conference2008\\_Papers/Labour%20demand%20and%20exports\\_Rankin\\_Schoer\\_DPRU\\_Oct.pdf](http://www.commerce.uct.ac.za/Research_Units/DPRU/Conference2008/Conference2008_Papers/Labour%20demand%20and%20exports_Rankin_Schoer_DPRU_Oct.pdf) (Date of access: 31 May 2011).
- SOUTH AFRICAN GOVERNMENT. 2010. The new growth path: The framework.  
<http://www.info.gov.za/view/DownloadFileAction?id=135748> (Date of access: 31 May 2011).
- SUÁREZ-ORTEGA, S. 2003. Export barriers: insights from small and medium-sized firms. *International Small Business Journal*, 21(4): 403-419.
- SZABÓ, A. 2002. Internationalisation of SMEs, entrepreneurship and SME's: The UNECE approach, entrepreneurship and SME development. UNECE.
- WESTHEAD, P., WRIGHT, M. & UCBASARAN, D. 2002. International market selection strategies selected by 'micro' and 'small' firms. *Omega, International Journal of Management Sciences*, 30(1): 51-68.
- YANG, Y.S., LEONE, R.P. & ALDEN, D.L. 1992. A market expansion ability approach to identify potential exporters. *Journal of Marketing*, 56(1): 84-96.
- YAPRAK, A. 1985. Empirical study of the differences between small exporting and non-exporting US firms. *International Marketing Review*, 2(2): 72-83.